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This is a data report presenting the species and abundance of phytoplankton in the 13 lakes sampled by the National Eutrophication Survey in the State of Colorada. Results from the calculation of several water quality indices are also included (Nygaard's Trophic State Index, Palmer's Organic Pollution Index, and species diversity and abundance indices).

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DISTRIBUTION OF PHYTOPLANKTON IN COLORADO LAKES

by

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FOREWORD

Protection of the environment requires effective regulatory actions which are based on sound technical and scientific information. This information must include the quantitative description and linking of pollutant sources, transport mechanisms, interactions, and resulting effects on man and his environment. Because of the complexities involved, assessment of specific pollutants in the environment requires a total systems approach which transcends the media of air, water, and land. The Environmental Monitoring and Support Laboratory-Las Vegas contributes to the formation and enhancement of a sound monitoring data base for exposure assessment through programs designed to:

- develop and optimize systems and strategies for monitoring pollutants and their impact on the environment
- demonstrate new monitoring systems and technologies by applying them to fulfill special monitoring needs of the Agency's operating programs

This report presents the species and abundance of phytoplankton in the 13 lakes sampled by the National Eutrophication Survey in the State of Colorado, along with results from the calculation of several commonly used biological indices of water quality and community structure. These data can be used to biologically characterize the study lakes, and as baseline data for future investigations. This report was written for use by Federal, State, and local governmental agencies concerned with water quality analysis, monitoring, and/or regulation. Private industry and individuals similarly involved with the biological aspects of water quality will find the document useful. For further information contact the Water and Land Quality Branch, Monitoring Operations Division.

George B. Morgan
Director
Environmental Monitoring and Support Laboratory
Las Vegas

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INTRODUCTION

The collection and analysis of phytoplankton data were included in the National Eutrophication Survey in an effort to determine relationships between algal characteristics and trophic status of individual lakes.

During spring, summer, and fall of 1975, the Survey sampled 156 lakes in 11 States. Over 450 algal species and varieties were identified and enumerated from the 430 water samples examined.

This report presents the species and abundance of phytoplankton in the 13 lakes sampled in the State of Colorado (Table 1). The Nygaard's Trophic State (Nygaard 1949), Palmer's Organic Pollution (Palmer 1969), and species diversity and abundance indices are also included.

TABLE 1. LAKES SAMPLED IN THE STATE OF COLORADO

STORET No.	Lake Name	County
0801	Barker Lake	Boulder
0802	Barr Lake	Adams
0803	Blue Mesa Reservoir	Gunnison, Montrose
0804	Cherry Creek	Arapahoe
0805	Cucharas Reservoir	Huerfano
0806	Dillon Lake	Summit
0807	Grand Lake	Grand
0808	Green Mountain Reservoir	Summit
0809	Holbrook Lake	Otero
0810	Lake Meredith	Crowley
0811	Milton Reservoir	Weld
0812	Navajo Lake	Archuleta (San Juan, Rio Arriba in N. Mex.)
0813	Shadow Mountain Lake	Grand

MATERIALS AND METHODS

LAKE AND SITE SELECTION

Lakes and reservoirs included in the Survey were selected through discussions with State water pollution agency personnel and U.S. Environmental Protection Agency Regional Offices (U.S. Environmental Protection Agency 1975). Screening and selection strongly emphasized lakes with actual or potential accelerated eutrophication problems. As a result, the selection was limited to lakes:

(1) impacted by one or more municipal sewage treatment plant outfalls either directly into the lake or by discharge to an inlet tributary within approximately 40 kilometers of the lake;

(2) 40 hectares or larger in size; and

(3) with a mean hydraulic retention time of at least 30 days.

Specific selection criteria were waived for some lakes of particular State interest.

Sampling sites for a lake were selected based on available information on lake morphometry, potential major sources of nutrient input, and on-site judgment of the field limnologist (U.S. Environmental Protection Agency 1975). Primary sampling sites were chosen to reflect the deepest portion of each major basin in a test lake. Where many basins were present, selection was guided by nutrient source information on hand. At each sampling site, a depth-integrated phytoplankton sample was taken. Depth-integrated samples were uniform mixtures of water from the surface to a depth of 15 feet (4.6 meters) or from the surface to the lower limit of the photic zone representing 1 percent of the incident light, whichever was greater. If the depth at the sampling site was less than 15 feet (4.6 meters), the sample was taken from just off the bottom to the surface. Normally, a lake was sampled three times in 1 year, providing information on spring, summer, and fall conditions.

SAMPLE PREPARATION

To preserve the sample 4 milliliters (ml) of Acid-Lugol's solution (Prescott 1970) were added to each 130-ml sample from each site at the time of collection. The samples were shipped to the Environmental Monitoring and Support Laboratory, Las Vegas, Nevada, where equal volumes from each site

were mixed to form two 130-ml composite samples for a given lake. One composite sample was put into storage and the other was used for the examination.

Prior to examination, the composite samples were concentrated by the settling method. Solids were allowed to settle for at least 24 hours prior to siphoning off the supernate. The volume of the removed supernate and the volume of the remaining concentrate were measured and concentrations determined. A small (8-ml) library subsample of the concentrate was then taken. The remaining concentrate was gently agitated to resuspend the plankton and poured into a capped, graduated test tube. If a preliminary examination of a sample indicated the need for a more concentrated sample, the contents of the test tube were further concentrated by repeating the settling method. Final concentrations varied from 15 to 40 times the original.

Permanent slides were prepared from concentrated samples after analysis was complete. A ring of clear Karo® corn syrup with phenol (a few crystals of phenol were added to each 100 ml of syrup) was placed on a glass slide. A drop of superconcentrate from the bottom of the test tube was placed in the ring. This solution was thoroughly mixed and topped with a coverglass. After the syrup at the edges of the coverglass had hardened, the excess was scraped away and the mount was sealed with clear fingernail polish. Permanent diatom slides were prepared by drying sample material on a coverglass, heating in a muffle furnace at 400° C for 45 minutes, and mounting in Hyrax®. Finally, the mounts were sealed with clear fingernail polish.

Backup samples, library samples, permanent sample slides, and Hyrax®-mounted diatom slides are being stored and maintained at the Environmental Monitoring and Support Laboratory-Las Vegas.

EXAMINATION

The phytoplankton samples were examined with the aid of binocular compound microscopes. A preliminary examination was performed to precisely identify and list all forms encountered. The length of this examination varied depending on the complexity of the sample. An attempt was made to find and identify all of the forms present in each sample. Often forms were observed which could not be identified to species or to genus. Abbreviated descriptions were used to keep a record of these forms (e.g., lunate cell, blue-green filament, Navicula #1). Diatom slides were examined using a standard light microscope. If greater resolution was essential to accurately identify the diatoms, a phase-contrast microscope was used.

After the species list was compiled, phytoplankton were enumerated using a Neubauer Counting Chamber with a 40X objective lens and a 10X ocular lens. All forms within each field were counted. The count was continued until a minimum of 100 fields had been viewed, or until the dominant form had been observed a minimum of 100 times.

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QUALITY CONTROL

Project phycologists performed internal quality control intercomparisons regularly on 7 percent of the species identification and counts. Although an individual had primary responsibility for analyzing a sample, taxonomic problems were discussed among the phycologists.

Additional quality control checks were performed on the Survey samples by Dr. G. W. Prescott of the University of Montana at the rate of 5 percent. Quality control checks were made on 75 percent of these samples to verify species identifications while checks were made on the remaining 25 percent of the samples to verify genus counts. Presently, the agreement between quality control checks for species identification and genus enumerations is satisfactory.

RESULTS

A phytoplankton species list for the State is presented in Appendix A. Appendix B summarizes all of the phytoplankton data collected from the State by the Survey. The latter is organized by lake, and includes an alphabetical phytoplankton species list with concentrations for individual species given by sampling date. Results from the application of several indices are presented (Nygaard's Trophic State, Palmer's Organic Pollution, and species diversity and abundance). Each lake has been assigned a four-digit STORET number. (STORET (STOrage and RETrieval) is the U.S. Environmental Protection Agency's computer system which processes and maintains water quality data.) The first two digits of the STORET number identify the State; the last two digits identify the lake.

NYGAARD'S TROPHIC STATE INDICES

Five indices devised by Nygaard (1949) were proposed under the assumption that certain algal groups are indicative of levels of nutrient enrichment. These indices were calculated in order to aid in determining the surveyed lakes' trophic status. As a general rule, Cyanophyta, Euglenophyta, centric diatoms, and members of the Chlorococcales are found in waters that are eutrophic (rich in nutrients), while desmids and many pennate diatoms generally cannot tolerate high nutrient levels and so are found in oligotrophic waters (poor in nutrients).

In applying the indices to the Survey data, the number of taxa in each major group was determined from the species list for each sample. The ratios of these groups give numerical values which can be used as a biological index of water richness. The five indices and the ranges of values established for Danish lakes by Nygaard for each trophic state are presented in Table 2. The appropriate symbol, (E) eutrophic and (O) oligotrophic, follows each calculated value in the tables in Appendix B. A question mark (?) following a calculated value in these tables was entered when that value was within the range of both classifications.

PALMER'S ORGANIC POLLUTION INDICES

Palmer (1969) analyzed reports from 165 authors and developed algal pollution indices for use in rating water samples with high organic pollution. Two lists of organic-pollution-tolerant forms were prepared, one containing 20 genera, the other, 20 species (Tables 3 and 4). Each form was assigned a pollution index number ranging from 1 for moderately tolerant forms to 6 for

TABLE 2. NYGAARD'S TROPHIC STATE INDICES ADAPTED FROM HUTCHINSON (1967)

Index	Calculation	Oligotrophic	Eutrophic
Myxophycean	$\frac{\text{Myxophyceae}}{\text{Desmideae}}$	0.0-0.4	0.1-3.0
Chlorophycean	$\frac{\text{Chlorococcales}}{\text{Desmideae}}$	0.0-0.7	0.2-9.0
Diatom	$\frac{\text{Centric Diatoms}}{\text{Pennate Diatoms}}$	0.0-0.3	0.0-1.75
Euglenophyte	$\frac{\text{Euglenophyta}}{\text{Myxophyceae + Chlorococcales}}$	0.0-0.2	0.0-1.0
Compound	$\frac{\text{Myxophyceae + Chlorococcales + Centric Diatoms + Euglenophyta}}{\text{Desmideae}}$	0.0-1.0	1.2-25

TABLE 3. ALGAL GENUS POLLUTION INDEX (Palmer 1969)

Genus	Pollution Index
Anacystis	1
Ankistrodesmus	2
Chlamydomonas	4
Chlorella	3
Closterium	1
Cyclotella	1
Euglena	5
Gomphonema	1
Lepocinclis	1
Melosira	1
Micractinium	1
Navicula	3
Nitzschia	3
Oscillatoria	5
Pandorina	1
Phacus	2
Phormidium	1
Scenedesmus	4
Stigeoclonium	2
Synedra	2

TABLE 4. ALGAL SPECIES POLLUTION INDEX (Palmer 1969)

Species	Pollution Index
Ankistrodesmus falcatus	3
Arthrospira jenneri	2
Chlorella vulgaris	2
Cyclotella meneghiniana	2
Euglena gracilis	1
Euglena viridis	6
Gomphonema parvulum	1
Melosira varians	2
Navicula cryptocephala	1
Nitzschia acicularis	1
Nitzschia palea	5
Oscillatoria chlorina	2
Oscillatoria limosa	4
Oscillatoria princeps	1
Oscillatoria putrida	1
Oscillatoria tenuis	4
Pandorina morum	3
Scenedesmus quadricauda	4
Stigeoclonium tenue	3
Synedra ulna	3

extremely tolerant forms. Palmer based the index numbers on occurrence records and/or where emphasized by the authors as being especially tolerant of organic pollution.

In analyzing a water sample, any of the 20 genera or species of algae present in concentrations of 50 per milliliter or more are recorded. The pollution index numbers of the algae present are totaled, providing a genus score and a species score. Palmer determined that a score of 20 or more for either index can be taken as evidence of high organic pollution, while a score of 15 to 19 is taken as probable evidence of high organic pollution. Lower figures suggest that the organic pollution of the sample is not high, that the sample is not representative, or that some substance or factor interfering with algal persistence is present and active.

SPECIES DIVERSITY AND ABUNDANCE INDICES

"Information content" of biological samples is being used commonly by biologists as a measure of diversity. Diversity in this connection means the degree of uncertainty attached to the specific identity of any randomly selected individual. The greater the number of taxa and the more equal their proportions, the greater the uncertainty, and hence, the diversity (Pielou 1966). There are several methods of measuring diversity, e.g., the formulas given by Brillouin (1962) and Shannon and Weaver (1963). The method which is appropriate depends on the type of biological sample on hand.

Pielou (1966) classifies the types of biological samples and gives the measure of diversity appropriate for each type. The Survey phytoplankton samples are what she classifies as larger samples (collections in Pielou's terminology) from which random subsamples can be drawn. According to Pielou, the average diversity per individual (H) for these types of samples can be estimated from the Shannon-Wiener formula (Shannon and Weaver 1963):

$$H = -\sum_{i=1}^{S} P_i \log_x P_i$$

where P is the proportion of the ith taxon in the sample, which is calculated from n_i/N; n_i is the number of individuals per milliliter of the ith taxon; N is the total number of individuals per ml; and S is the total number of taxa. However, Basharin (1959) and Pielou (1966) have pointed out that H calculated from the subsample is a biased estimator of the sample H, and if this bias is to be accounted for, we must know the total number of taxa present in the sample since the magnitude of this bias depends on it.

Pielou (1966) suggests that if the number of taxa in the subsample falls only slightly short of the number in the larger sample, no appreciable error will result in considering S, estimated from the subsample, as being equal to the sample value. Even though considerable effort was made to find and identify all taxa, the Survey samples undoubtedly contain a fair number of rare phytoplankton taxa which were not encountered.

In the Shannon-Wiener formula, an increase in the number of taxa and/or an increase in the evenness of the distribution of individuals among taxa will increase the average diversity per individual from its minimal value of zero. Sager and Hasler (1969) found that the richness of taxa was of minor importance in determination of average diversity per individual for phytoplankton and they concluded that phytoplankton taxa in excess of the 10 to 15 most abundant ones have little effect on H. This was verified by our own calculations. Our counts are in number per milliliter and since logarithms to the base 2 were used in our calculations, H is expressed in units of bits per individual. When individuals of a taxon were so rare that they were not counted, a value of 1/130 per milliliter or 0.008 per milliliter was used in the calculations since at least one individual of the taxon must have been present in the collection.

A Survey sample for a given lake represents a composite of all phytoplankton collected at different sampling sites on the lake during a given sampling period. Since the number of samples (M) making up a composite is a function of both the complexity of the lake sampled and its size, it should affect the richness-of-taxa component of the diversity of our phytoplankton collections. The maximum diversity (MaxH) (i.e., when the individuals are distributed among the taxa as evenly as possible) was estimated from $\log_2 S$ (Pielou 1966) while the minimum diversity (MinH), was estimated from the formula:

$$\text{MinH} = -\frac{S-1}{N}\log_2\frac{1}{N} - \frac{N-(S-1)}{N}\log_2\frac{N-(S-1)}{N}$$

given by Zand (1976). The total diversity (D) was calculated from HN (Pielou 1966). Also given in Appendix B are L (the mean number of individuals per taxa per milliliter) and K (the number of individuals per milliliter of the most abundant taxon in the sample).

The evenness component of diversity (J) was estimated from H/MaxH (Pielou 1966). Relative evenness (RJ) was calculated from the formula:

$$\text{RJ} = \frac{\text{H-MinH}}{\text{MaxH-MinH}}$$

given by Zand (1976). Zand suggests that RJ be used as a substitute for both J and the redundancy expression given by Wilhm and Dorris (1968). As pointed out by Zand, the redundancy expression given by Wilhm and Dorris does not properly express what it is intended to show, i.e., the position of H in the range between MaxH and MinH. RJ may range from 0 to 1; being 1 for the most even samples and 0 for the least even samples.

Zand (1976) suggests that diversity indices be expressed in units of "sits", i.e., in logarithms to base S (where S is the total number of taxa in the sample) instead of in "bits", i.e., in logarithms to base 2. Zand points out that the diversity index in sits per individual is a normalized number ranging from 1 for the most evenly distributed samples to 0 for the least evenly distributed samples. Also, it can be used to compare different samples, independent of the number of taxa in each. The diversity in bits per

individual should not be used in direct comparisons involving various samples which have different numbers of taxa. Since MaxH equals log S, the expression in sits is equal to $\log_S S$, or 1. Therefore diversity in sits per individual is numerically equivalent to J, the evenness component for the Shannon-Wiener formula.

SPECIES OCCURRENCE AND ABUNDANCE

The alphabetic phytoplankton species list for each lake, presented in Appendix B, gives the concentrations of individual species by sampling date. Concentrations are in cells, colonies, or filaments (CEL, COL, FIL) per milliliter. An "X" after a species name indicates that the species identified in the preliminary examination was in such a low concentration that it did not appear in the count. A blank space indicates that the organism was not found in the sample collected on that date. Column S is used to designate the examiner's subjective opinion of the five dominant taxa in a sample, based upon relative size and concentration of the organism. The percent column (%C) presents, by abundance, the percentage composition of each taxon.

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APPENDIX A

PHYTOPLANKTON SPECIES LIST FOR THE STATE OF COLORADO

Actinastrum gracilimum
Anabaena planctonica
Anabaenopsis circularis
Ankistradesmus falcatus
v. *acicularis*
Ankistradesmus falcatus
v. *mirabilis*
Aphanizamenon flos-aquae
Aphanocapsa
Asterionella formosa
Binuclearia
Carteria
Ceratium hirundinella
f. *scotticum*
Chlorogonium
Chroococcus dispersus
Chroococcus limneticus
Closterium
Cocconeis placentula
Coelastrum microporum
Coelastrum sphaericum
Coelosphaerium kuetzingianum
Coelosphaerium pallidum
Cosmarium
Cryptamonas erosa
Cryptamonas marssonii
Cryptamonas reflexa
Cryptamonas rostrata
Cyclotella bodanica
Cyclotella comta
Cyclotella meneghiniana
Cymatopleura elliptica
Cymatopleura solea
Cymbella mexicana
Dactylococcopsis
Diatoma tenue
v. *elongatum*
Diatoma vulgare
Dictyosphaerium pulchellum
Dinobryon bavaricum
Dinobryon cylindricum
Dinobryon divergens
Entomoneis alata
Epithemia
Euglena oxyuris
v. *minor*
Fragilaria construens
Fragilaria crotonensis
Fragilaria leptostauron
Glenodinium edax
Gomphonema olivaceum
Gomphosphaeria
Gymnodinium
Gyrosigma
Hannaea arcus
Hantzschia
Lagerheimia
Lyngbya
Mallomonas
Melosira distans
Melosira granulata
v. *angustissima*
Melosira italica
Melosira varians
Merismopedia minima
Merismopedia tenuissima
Micractinium pusillum
Microcystis aeruginosa
Microcystis incerta
Mougeotia
Navicula amphibola
Navicula cuspidata
Nitzschia longissima
v. *reversa*
Oedogonium
Oocystis
Oscillatoria limnetica
Pediastrum boryanum
Pediastrum duplex
Pediastrum duplex
v. *clathratum*
Pediastrum duplex
v. *reticulatum*
Pediastrum simplex
v. *duodenarium*
Phacus megalopsis
Phacus pleuronectes
Phacus pseudonordstedtii
Phacus tortus
Phormidium mucicola
Pleurosigma
Raphidiopsis
Rhoicosphenia curvata
Rhopalodia gibba
Scenedesmus acuminatus
Scenedesmus armatus
Scenedesmus dimorphus
Scenedesmus quadricauda
Schroederia judayi
Schroederia setigera

Spermatozoopsis
Sphaerocystis schroeteri
Spirulina
Spondylosium planum
Staurastrum
Stephanodiscus dubius
Stephanodiscus niagarae
Synedra cyclopum
Synedra ulna
Tabellaria fenestrata
Tetraedron minimum
Tetraedron muticum
Tetrastrum elegans
Tetrastrum staurogeniaeforme
Trachelamonas intermedia
Trachelamonas planctonica

APPENDIX B. SUMMARY OF PHYTOPLANKTON DATA

This appendix was generated by computer. Because it was only possible to use upper case letters in the printout, all scientific names are printed in upper case and are not italicized.

The alphabetic phytoplankton lists include taxa without species names (e.g., EUNOTIA, EUNOTIA #1, FLAGELLATE, FLAGELLATES, MICROCYSTIS INCERTA ?, CHLOROPHYTAN COCCOID CELLED COLONY). When species determinations were not possible, symbols or descriptive phrases were used to separate taxa for enumeration purposes. Each name on a list, however, represents a unique species different from any other name on the same list, unless otherwise noted, for counting purposes.

Numbers were used to separate unidentified species of the same genus. A generic name listed alone is also a unique species. A question mark (?) is placed immediately after the portion of a name which was assigned with uncertainty. Numbered, questioned, or otherwise designated taxa were established on a lake-by-lake basis; therefore NAVICULA #2 from lake A cannot be compared to NAVICULA #2 from lake B. Pluralized categories (e.g., FLAGELLATES, CENTRIC DIATOMS, SPP.) were used for counting purposes when taxa could not be properly differentiated on the counting chamber.

LAKE NAME: BARKER
STORET NUMBER: 0801

NYGAARD TROPHIC STATE INDICES

DATE	05 07 75	08 26 75	10 10 75
MYXOPHYCEAN	1,00 E	2,00 E	01/0 E
CHLOROPHYCEAN	0/01 D	1,00 E	03/0 E
EUGLENOPHYTE	0/01 ?	0/03 ?	0,25 E
DIATOM	0,50 E	1,00 E	0,50 E
COMPOUND	3,00 E	5,00 E	07/0 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	05 07 75	08 26 75	10 10 75
GENUS	01	01	10
SPECIES	00	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		05 07 75	08 26 75	10 10 75
AVERAGE DIVERSITY	H	1,25	2,00	0,99
NUMBER OF TAXA	S	16,00	10,00	15,00
NUMBER OF SAMPLES COMPOSITED	N	2,00	2,00	2,00
MAXIMUM DIVERSITY	MAXH	4,00	3,32	3,91
MINIMUM DIVERSITY	MINH	0,02	0,04	0,03
TOTAL DIVERSITY	D	14330,00	5114,00	7608,15
TOTAL NUMBER OF INDIVIDUALS/ML	N	11464,00	2557,00	7685,00
EVENNESS COMPONENT	J	0,31	0,60	0,25
RELATIVE EVENNESS	RJ	0,31	0,60	0,25
MEAN NUMBER OF INDIVIDUALS/TAXA	L	716,50	255,70	512,33
NUMBER/ML OF MOST ABUNDANT TAXON	K	9013,00	1381,00	6478,00

LAKE NAME: BARKER
STORET NUMBER: 0801

CONTINUED

TAXA	FORM	08 07 75			08 26 75			10 10 75		
		ID	%C	ALGAL UNITS PER ML	ID	%C	ALGAL UNITS PER ML	ID	%C	ALGAL UNITS PER ML
ANABAENA	FIL				131	2.0	51			
ANABAENOPSIS CIRCULARIS	FIL						X			
ASTERIONELLA FORMOSA	CEL		0.3	36		2.0	51			X
CARTERIA	CEL			X						
CHLAMYDOMONAS ?	CEL							11	84.3	6470
CHROOMONAS ?	CEL	131	6.3	721	1	10.0	256	14	2.7	208
COCCONEIS PLACENTULA	CEL			X						
COSMARIUM	CEL			X						
CRYPTOMONAS	CEL				191	2.0	51			
CRYPTOMONAS EROSA	CEL		0.9	100				13	0.9	42
CRYPTOMONAS MARSSONII	CEL	191	0.9	100						
DACTYLOCOCCOPSIS	CEL		0.3	36						
DICTYOSPHAERIUM PULCHELLUM	COL						X			
DINOBRYON CYLINDRICUM	CEL			X						
FRAGILARIA CONSTRUENS	CEL									X
FRAGILARIA CROTONENSIS	CEL	131	5.3	613	11	54.0	1381			X
GOMPHONEMA OLIVACEUM	CEL		0.3	36						X
GYMNODINIUM	CEL			X						
HANNAEA ARCUS	CEL			X						
MALLOMONAS	CEL									X
MALLOMONAS ?	CEL		0.6	72						
MELOSIRA DISTANS	CEL	141	6.3	721	1	4.0	102	13	4.9	374
MELOSIRA GRANULATA V. ANGUSTISSIMA	CEL							13	4.9	374
MELOSIRA ITALICA	CEL	11	79.6	9013	14	4.0	102			
OSCILLATORIA	FIL								1.9	135
PEDIASTRUM BORYANUM	COL									X
PEDIASTRUM SIMPLEX V. DUODENARIUM	COL									X
SCHROEDERIA SETIGERA	CEL								0.9	42
SPONDYLOSIUM PLANUM	CEL				12	23.0	963			
TRACHELOMONAS	CEL								0.9	42
TOTAL				11464			2957			7695

LAKE NAME: BARR LAKE
STORET NUMBER: 0802

WYGAARD TROPHIC STATE INDICES

DATE	05 05 75	08 26 75	10 10 75
MYXOPHYCEAN	0/0 O	05/0 E	03/0 E
CHLOROPHYCEAN	01/0 E	02/0 E	02/0 E
EUGLENOPHYTE	0/01 ?	0/07 ?	0,20 ?
DIATOM	0/02 ?	01/0 E	1,00 E
COMPOUND	01/0 E	08/0 E	08/0 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	05 05 75	08 26 75	10 10 75
GENUS	00	01	05
SPECIES	00	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		05 05 75	08 26 75	10 10 75
AVERAGE DIVERSITY	H	1,79	0,46	1,39
NUMBER OF TAXA	S	7,00	9,00	12,00
NUMBER OF SAMPLES COMPOSITED	M	2,00	2,00	2,00
MAXIMUM DIVERSITY	MAXH	2,81	3,17	3,58
MINIMUM DIVERSITY	MINH	0,03	0,03	0,09
TOTAL DIVERSITY	D	4204,71	1612,30	1948,78
TOTAL NUMBER OF INDIVIDUALS/ML	N	2349,00	3505,00	1402,00
EVENNESS COMPONENT	J	0,64	0,15	0,39
RELATIVE EVENNESS	RJ	0,64	0,14	0,38
MEAN NUMBER OF INDIVIDUALS/TAXA	L	335,57	389,44	116,83
NUMBER/ML OF MOST ABUNDANT TAXON	K	1149,00	3265,00	1012,00

LAKE NAME: BARR LAKE
STORET NUMBER: 0802

CONTINUED

TAXA	FORM	08 05 75			08 26 75			10 10 75		
		%	%	ALGAL UNITS PER ML	%	%	ALGAL UNITS PER ML	%	%	ALGAL UNITS PER ML
ANABAENA	FIL						X			X
APHANIZOMENON FLOS-AQUAE	FIL				1	93.2	3260	11	72.2	1013
CHROOMONAS ?	CEL	14	49.9	1140				10	9.6	79
CRYPTOMONAS EROSA	CEL	11	28.9	979						X
CRYPTOMONAS MARSSONII	CEL	13	6.7	157						
CYST	COL	19	2.2	52			X			
DICTYOSPHAERIUM PULCHELLUM	CEL									X
EUGLENA	COL				13	2.7	96			
GOMPHOSPHAERIA	CEL							13	11.1	156
MELOSIRA							X			
MELOSIRA GRANULATA	CEL				13	2.7	96	12	9.6	79
V. ANGUSTISSIMA	COL			X				14	9.6	79
MICROCYSTIS AERUGINOSA	CEL									X
NITZSCHIA 01	CEL						X			
NITZSCHIA 02	COL				14	1.4	48			
OOCYSTIS	COL									X
PEDIASTRUM DUPLEX	COL									
PHORMIDIUM MUCICOLA	COL	13	13.3	313						X
SCENEDESMUS ACUMINATUS	CEL									
SCHROEDERIA SETIGERA	CEL			X						
STEPHANODISCUS	CEL									
SYNEDRA				2349			3504			1402
TOTAL										

LAKE NAME: BLUE MESA RES.
STORET NUMBER: 0803

NYGAARD TROPHIC STATE INDICES

DATE	08 25 75	09 30 75
MYXOPHYCEAN	2.00 E	01/0 E
CHLOROPHYCEAN	3.00 E	01/0 E
EUGLENOPHYTE	0/05 ?	0/02 ?
DIATON	0.33 E	0/01 ?
COMPOUND	6.00 E	02/0 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	08 25 75	09 30 75
GENUS	01	00
SPECIES	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		08 25 75	09 30 75
AVERAGE DIVERSITY	H	2.12	0.59
NUMBER OF TAXA	S	12.00	5.00
NUMBER OF SAMPLES COMPOSITED	M	6.00	6.00
MAXIMUM DIVERSITY	MAXH	3.58	2.32
MINIMUM DIVERSITY	MINH	0.06	0.01
TOTAL DIVERSITY	D	5249.12	2838.49
TOTAL NUMBER OF INDIVIDUALS/ML	N	2476.00	4811.00
EVENNESS COMPONENT	J	0.59	0.25
RELATIVE EVENNESS	RJ	0.59	0.26
MEAN NUMBER OF INDIVIDUALS/TAXA	L	206.33	962.20
NUMBER/ML OF MOST ABUNDANT TAXON	K	1324.00	4391.00

LAKE NAME: BLUE MESA RES. CONTINUED
STORET NUMBER: 0001

TAXA	FORM	08 25 75 IB	08 25 75 QC	08 25 75 ALGAL UNITS PER ML	09 30 75 IB	09 30 75 QC	09 30 75 ALGAL UNITS PER ML
APHANIZOMENON FLOS-AQUAE	FIL	11	83,8	1324	11	91,3	4391
ASTERIONELLA FORMOSA	CEL			X			
CHROOMONAS ?	CEL	13	10,6	461	12	3,9	187
CRYPTOMONAS EROSA	CEL	12	9,3	230	14	1,9	93
CYMBELLA	CEL			X			
FRAGILARIA CROTONENSIS	CEL	19	4,6	115	13	1,9	93
MICROCYSTIS INCERTA	COL	14	4,6	115			
OOCYSTIS	CEL			X			
SCHROEDERIA SETIGERA	CEL		4,6	115	19	1,0	47
STAURASTRUM	CEL			X			
STEPHANODISCUS	CEL		2,3	59			
TETRAEDRON MUTICUM	CEL		2,3	59			
TOTAL				2476			4811

LAKE NAME: CHERRY CREEK
STORET NUMBER: 0804

NYGAARD TROPHIC STATE INDICES

DATE	05 07 75	08 22 75	10 09 75
MYXOPHYCEAN	0/0 D	1.00 E	0.50 E
CHLOROPHYCEAN	01/0 E	0/01 O	1.25 E
EUGLENOPHYTE	0/01 ?	1.00 E	0.71 E
DIATOM	0.17 ?	0.23 ?	0.33 E
COMPOUND	02/0 E	5.00 E	3.50 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	05 07 75	08 22 75	10 09 75
GENUS	00	04	02
SPECIES	00	00	03

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		05 07 75	08 22 75	10 09 75
AVERAGE DIVERSITY	H	2.15	2.53	2.51
NUMBER OF TAXA	S	12.00	24.00	27.00
NUMBER OF SAMPLES COMPOSITED	M	3.00	3.00	3.00
MAXIMUM DIVERSITY	MAXH	3.58	4.58	4.75
MINIMUM DIVERSITY	MINH	0.08	0.10	0.32
TOTAL DIVERSITY	D	3614.15	7293.99	2281.59
TOTAL NUMBER OF INDIVIDUALS/ML	N	1681.00	2883.00	909.00
EVENNESS COMPONENT	J	0.60	0.55	0.53
RELATIVE EVENNESS	RJ	0.60	0.55	0.50
MEAN NUMBER OF INDIVIDUALS/TAXA	L	140.08	120.13	33.67
NUMBER/ML OF MOST ABUNDANT TAXON	K	841.00	920.00	373.00

LAKE NAME: CHERRY CREEK CONTINUED
STORET NUMBER: 0804

TAXA	FORM	05 07 75			08 22 75			10 09 75		
		IS	%C	ALGAL UNITS PER ML	IS	%C	ALGAL UNITS PER ML	IS	%C	ALGAL UNITS PER ML
ANABAENA	FIL						X			
ANABAENOPSIS	FIL									X
ANKISTRODESMUS FALCATUS V. ACICULARIS	CEL									X
ANKISTRODESMUS FALCATUS V. MIRABILIS	CEL	1	1,0	31				14	13,4	124
ASTERIONELLA FORMOSA	CEL	14	14,9	249			X			
BINUCLEARIA	FIL				1	4,3	123			
CHROOMONAS ?	CEL	12	80,0	841			X			
CLOSTERIUM	CEL									X
CLOSTERIUM #2	CEL									X
CLOSTERIUM #3	CEL									X
COCCONEIS PLACENTULA	CEL						X			X
COELOSPHAERIUM PALLIDUM	COL									X
COSMARIUM	CEL						X			
CRYPTOMONAS EROSA	CEL			X	15	6,4	184	13	13,4	124
CRYPTOMONAS MARSSONII	CEL	1	16,7	280						
CRYPTOMONAS REFLEXA	CEL							12	13,4	124
CRYPTOMONAS ROSTRATA	CEL	19	3,7	62						
CYMATOPLEURA ELLIPTICA	CEL			X						
CYMATOPLEURA SOLEA	CEL	1	1,0	31						
CYMBELLA #1	CEL				1	4,3	123			
CYMBELLA MEXICANA	CEL				14	2,1	61			
DIATOMA TENUE V. ELONGATUM	CEL				32	31,9	920			
DIATOMA VULGARE	CEL									X
EPITHEMIA	CEL						X			
EUGLENA OXYURIS V. MINOR	CEL									X
FLAGELLATE	CEL									X
FRAGILARIA CROTONENSIS	CEL				11	31,9	920			X
GOMPHONEMA	CEL				1	2,1	61			
GYROSIGMA	CEL									X
NANTZSCHIA	CEL			X						
MELOSIRA GRANULATA V. ANGUSTISSIMA	CEL						X			
MELOSIRA ITALICA	CEL							1	4,9	41
MELOSIRA VARIANS	CEL						X			
MOUGEOTIA	FIL						X			
NAVICULA #1	CEL						X			
NAVICULA #2	CEL	1	1,0	31	1	10,6	307			
NAVICULA AMPHIBOLA	CEL									X
NITZSCHIA	CEL									X
NITZSCHIA LONGISSIMA V. REVERSA	CEL						X			
OEDOGONIUM	FIL						X			
OOCYSTIS	COL							1	4,9	41
PEDIASTRUM DUPLEX V. CLATHRATUM	COL									X
PHACUS PLEURONECTES	CEL									X
PHACUS TORTUS	CEL									X
RHOICOSPHENIA CURVATA	CEL						X			
RHOPALODIA GIBBA	CEL						X			
SCENEDESMUS QUADRICAUDA	COL							1	4,9	41
STAURASTRUM	CEL									X
STEPHANODISCUS	CEL	13	9,3	156	1					
STEPHANODISCUS NIAGARAE	CEL	1		1	13	6,4	184	19	4,9	41
SYNEDRA ULNA	CEL			X						
TRACHELOMONAS	CEL						X			
TRACHELOMONAS INTERMEDIA	CEL							11	41,0	373
TRACHELOMONAS PLANCTONICA	CEL									X
TOTAL				1681			2883			909

LAKE NAME: CUCHARAS RES.
STORET NUMBER: 0805

NYGAARD TROPHIC STATE INDICES

DATE	08 21 75
MYXOPHYCEAN	02/0 E
CHLOROPHYCEAN	06/0 E
EUGLENOPHYTE	0.12 ?
DIATOM	0.33 E
COMPOUND	10/0 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	08 21 75
GENUS	16
SPECIES	09

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		08 21 75
AVERAGE DIVERSITY	H	1.72
NUMBER OF TAXA	S	15.00
NUMBER OF SAMPLES COMPOSITED	M	1.00
MAXIMUM DIVERSITY	MAXH	3.91
MINIMUM DIVERSITY	MINH	0.00
TOTAL DIVERSITY	D	127102.84
TOTAL NUMBER OF INDIVIDUALS/ML	N	73897.00
EVENNESS COMPONENT	J	0.44
RELATIVE EVENNESS	RJ	0.44
MEAN NUMBER OF INDIVIDUALS/TAXA	L	4926.47
NUMBER/ML OF MOST ABUNDANT TAXON	K	42045.00

LAKE NAME: CUCHARAS RES.
STORET NUMBER: 0805

CONTINUED

08 31 78

TAXA	FORM	IB	%C	ALGAL UNITS PER ML
ACTINASTRUM GRACILIMUM	COL	1	0,3	212
ANKISTRODESMUS FALCATUS V. ACICULARIS	CEL	13	6,3	4672
CHROOMONAS ?	CEL	1	0,9	637
CRYPTOMONAS	CEL	1	0,3	212
CYANOPHYTAN FILAMENT	F/L	11	30,7	21235
CYCLOTELLA MENEGHINIANA	CEL	14	4,0	2973
DACTYLOCOCCOPSIS	CEL	12	56,9	42045
EUGLENA	CEL	1	0,3	212
MICRACTINIUM PUSILLUM	COL	1	0,6	425
NAVICULA	CEL	1		X
NITZSCHIA	CEL	1	0,9	637
NITZSCHIA LONGISSIMA V. REVERSA	CEL	1	0,3	212
OOCYSTIS	CEL	1		X
SCENEDESMUS DIMORPHUS	COL	1		X
SCENEDESMUS QUADRICAUDA	COL	18	0,6	425
TOTAL				73897

LAKE NAME: DILLON
STORET NUMBER: 0806

NYGAARD TROPHIC STATE INDICES

DATE	08 25 75	10 19 75
MYXOPHYCEAN	0/0 O	01/0 E
CHLOROPHYCEAN	01/0 E	01/0 E
EUGLENOPHYTE	0/01 ?	0/02 ?
DIATOM	0,33 E	0/04 ?
COMPOUND	02/0 E	02/0 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	08 25 75	10 19 75
GENUS	00	00
SPECIES	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		08 25 75	10 19 75
AVERAGE DIVERSITY	H	2,10	1,80
NUMBER OF TAXA	S	9,00	12,00
NUMBER OF SAMPLES COMPOSITED	N	4,00	4,00
MAXIMUM DIVERSITY	MAXH	3,17	3,58
MINIMUM DIVERSITY	MINH	0,03	0,03
TOTAL DIVERSITY	D	7606,20	10866,60
TOTAL NUMBER OF INDIVIDUALS/ML	M	3622,00	6037,00
EVENNESS COMPONENT	J	0,66	0,50
RELATIVE EVENNESS	RJ	0,66	0,50
MEAN NUMBER OF INDIVIDUALS/TAXA	L	402,44	503,08
NUMBER/ML OF MOST ABUNDANT TAXON	K	1837,00	3297,00

LAKE NAME: DILLON
STORET NUMBER: 0806

CONTINUED

TAXA	FORM	08 25 76			10 19 76		
		1B	%C	ALGAL UNITS PER ML	1B	%C	ALGAL UNITS PER ML
ANKISTRODESMUS FALCATUS	CEL			X			
ASTERIONELLA FORMOSA	CEL		10,7	604		24,6	1486
CHROOCOCCUS LIMNETICUS	COL						X
COCCOID COLONY	COL					1,8	93
CRYPTOMONAS EROSA	CEL		19,7	713		6,6	379
CYST	CEL					3,8	331
DISCOPTON DIVERGENS	CEL		10,8	306			X
EUDORINA ELEGANS	COL			X			
FLAGELLATE 01	CEL		42,4	1537		10,8	680
FRAGILARIA CROTONENSIS	CEL		10,8	306		54,6	3297
GOMPHOSENA	CEL			X			
MELOSIRA ITALICA	CEL			X			
NOUGEOTIA	PIL						X
OOCYSTIS	CEL						X
SYNEDRA CYCLOPUM	CEL						X
TABELLARIA FENESTRATA	CEL						X
TOTAL				3633			6037

LAKE NAME: GRAND LAKE
STORET NUMBER: 0807

NYGAARD TROPHIC STATE INDICES

DATE	08 26 75	10 10 75
MYXOPHYCEAN	1,50 E	1,00 E
CHLOROPHYCEAN	0,50 ?	1,00 E
EUGLENOPHYTE	0/04 ?	0/02 ?
DIATON	1,00 E	0,50 E
COMPOUND	2,50 E	3,00 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	08 26 75	10 10 75
GENUS	01	01
SPECIES	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		08 26 75	10 10 75
AVERAGE DIVERSITY	H	1,69	2,18
NUMBER OF TAXA	S	9,00	9,00
NUMBER OF SAMPLES COMPOSITED	M	2,00	2,00
MAXIMUM DIVERSITY	MAXH	3,17	3,17
MINIMUM DIVERSITY	MINH	0,09	0,11
TOTAL DIVERSITY	D	1695,07	1702,58
TOTAL NUMBER OF INDIVIDUALS/ML	N	1003,00	781,00
EVENNESS COMPONENT	J	0,53	0,69
RELATIVE EVENNESS	RJ	0,52	0,68
MEAN NUMBER OF INDIVIDUALS/TAXA	L	111,44	86,78
NUMBER/ML OF MOST ABUNDANT TAXON	K	523,00	339,00

LAKE NAME: GRAND LAKE
STORET NUMBER: 0807

CONTINUED

TAXA	FORM	08 26 75			10 10 75		
		IS	%C	ALGAL UNITS PER ML	IS	%C	ALGAL UNITS PER ML
ANABAENA	FIL	11	36.1	262	13	4.4	34
ASTERIONELLA FORMOSA	CEL	13	52.1	523	14	13.1	102
CLOSTERIUM	COL			X			
CRYPTOMONAS	CEL	13	13.1	131	13	17.4	136
DICTYOSPHAERIUM PULCHELLUM	COL					4.4	34
FRAGILARIA CROTONENSIS	CEL						X
HANNAEA ARCUS	CEL						X
MALLOMONAS	CEL						X
MELOSIRA ITALICA	CEL	14	8.7	87	15	17.4	136
OOCYSTIS	CEL			X			
OSCILLATORIA	FIL			X			
RAPHIDIOPSIS	FIL			X			
SPONDYLOSIUM	CEL			X			
SPONDYLOSIUM PLANUM	CEL				11	43.4	339
TOTAL				1003			781

LAKE NAME: GREEN MOUNTAIN RES.
STORET NUMBER: 0808

NYGAARD TROPHIC STATE INDICES

DATE	08 25 75		10 09 75	
MYXOPHYCEAN	0/0	O	0/0	O
CHLOROPHYCEAN	0/0	O	0/0	O
EUGLENOPHYTE	0/0	?	0/0	?
DIATOM	0.50	E	0.33	E
COMPOUND	01/0	E	01/0	E

PALMER'S ORGANIC POLLUTION INDICES

DATE	08 25 75	10 09 75
GENUS	01	01
SPECIES	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		08 25 75	10 09 75
AVERAGE DIVERSITY	H	0.59	1.11
NUMBER OF TAXA	S	6.00	6.00
NUMBER OF SAMPLES COMPOSITED	M	3.00	3.00
MAXIMUM DIVERSITY	MAXH	2.58	2.58
MINIMUM DIVERSITY	MINH	0.02	0.06
TOTAL DIVERSITY	D	2254.98	1006.77
TOTAL NUMBER OF INDIVIDUALS/ML	N	3822.00	907.00
EVENNESS COMPONENT	J	0.23	0.43
RELATIVE EVENNESS	RJ	0.23	0.42
MEAN NUMBER OF INDIVIDUALS/TAXA	L	637.00	151.17
NUMBER/ML OF MOST ABUNDANT TAXON	K	3470.00	635.00

LAKE NAME: GREEN MOUNTAIN RES, CONTINUED
STORET NUMBER: 0900

TAXA	FORM	08 25 75 IB	08 25 75 %C	08 25 75 ALGAL UNITS PER ML	10 09 75 IB	10 09 75 %C	10 09 75 ALGAL UNITS PER ML
ASTERIONELLA FORMOSA	CEL	13	3,9	132			
CHROOMONAS ?	CEL			X			
CRYPTOMONAS	CEL	14	2,3	88	13	6,4	60
CICLOTELLA CONTA	CEL	12	3,9	132	151	70,0	638
CYMBELLA	CEL						X
DINOBRYON	CEL			X			
FRAGILARIA CROTONENSIS	CEL	115	90,8	3470	12	23,4	212
GOMPHONEMA OLIVACEUM	CEL						X
NAVICULA ARCUS	CEL						X
TOTAL				3822			907

LAKE NAME: HOLBROOK LAKE
STORET NUMBER: 0809

NYGAARD TROPHIC STATE INDICES

DATE	05 06 75	08 21 75	10 07 75
MYXOPHYCEAN	02/0 E	05/0 E	5,00 E
CHLOROPHYCEAN	10/0 E	05/0 E	5,00 E
EUGLENOPHYTE	0,42 E	0,10 ?	0/10 ?
DIATOM	0,17 ?	2,00 E	2,00 E
COMPOUND	18/0 E	13/0 E	12,0 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	05 06 75	08 21 75	10 07 75
GENUS	20	12	08
SPECIES	07	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		05 06 75	08 21 75	10 07 75
AVERAGE DIVERSITY	H	2,00	1,89	1,90
NUMBER OF TAXA	S	27,00	17,00	18,00
NUMBER OF SAMPLES COMPOSITED	N	1,00	1,00	1,00
MAXIMUM DIVERSITY	MAXH	4,75	4,09	4,17
MINIMUM DIVERSITY	MINH	0,01	0,01	0,01
TOTAL DIVERSITY	D	132836,00	99444,24	106971,90
TOTAL NUMBER OF INDIVIDUALS/ML	N	66418,00	52616,00	56301,00
EVENNESS COMPONENT	J	0,42	0,46	0,46
RELATIVE EVENNESS	RJ	0,42	0,47	0,46
MEAN NUMBER OF INDIVIDUALS/TAXA	L	2459,93	3095,06	3127,83
NUMBER/ML OF MOST ABUNDANT TAXON	K	36005,00	33166,00	30347,00

LAKE NAME: HOLBROOK LAKE
STORET NUMBER: 0809

CONTINUED

TAXA	FORM	09 06 78			08 21 78			10 07 78		
		IB	%C	ALGAL UNITS PER ML	IB	%C	ALGAL UNITS PER ML	IB	%C	ALGAL UNITS PER ML
ACTINASTRUM GRACILIMUM	COL			X		0,3	181			
ANABAENA	FIL				13	4,0	2111			X
ANABAENOPSIS CIRCULARIS	FIL					1,7	905	18	1,4	898
ANABAENOPSIS SKHIAYA ?	FIL				116	63,0	33166	116	53,9	30347
ANKISTRODESMUS FALCATUS V. ACICULARIS	CEL	1	2,0	1318						
CHROOMONAS ?	CEL									X
CLOSTERIUM	CEL									X
COELASTRUM MICROPORUM	CEL			X						
COELASTRUM SPHAERICUM	COL									X
CRYPTOMONAS EROSA	CEL	14	3,0	1973		4,0	2111	14	3,7	2096
CRYPTOMONAS MARSSONII	CEL								0,9	499
CYLINDROTHECA ? GRACILIS	CEL			X						
DIATOMA TENUE V. ELONGATUM	CEL	1	0,7	493						
DICTIOSPHAERIUM PULCHELLUM	COL	1	0,3	164						X
EUGLENA	CEL			X			X			
EUGLENA #1	CEL	1	0,3	329						
FLAGELLATE	CEL	18	9,2	6083						
GLENODINIUM	CEL	1	0,3	329			X		0,2	100
GYROSIGMA	CEL	1	0,3	164						
NAVICULA	CEL			X						
NAVICULA CUSPIDATA	CEL			X						
NITZSCHIA LONGISSIMA V. REVERSA	CEL				15	2,3	1396	13	11,3	7487
OOCYSTIS	CEL			X						
OSCILLATORIA #1	FIL				121	16,0	8442	121	23,2	13077
OSCILLATORIA #2	FIL			X						
OSCILLATORIA LIMNETICA	FIL	111	54,2	36005	14	4,9	2863		1,8	998
PEDIASTRUM BORYANUM	COL			X			X			
PEDIASTRUM DUPLEX V. RETICULATUM	COL			X						
PHACUS MEGALOPSIS	CEL	1	0,7	493						
PHACUS PSEUDONORDSTEDTII	CEL			X						
SCENEDESMUS ACUMINATUS	COL	1	0,3	329			X			X
SCENEDESMUS DIMORPHUS	COL			X			X			
SCENEDESMUS QUADRICAUDA	COL	1	0,2	164						
SCENEDESMUS SPP.	COL					2,9	1598			
STEPHANODISCUS	CEL						X			X
STEPHANODISCUS DUBIUS	CEL	13	3,2	2137		0,6	303		1,4	799
SYNEDRA ?	CEL	121	24,8	16440						
TETRASTRUM ELEGANS	COL	1				0,3	191			X
TETRASTRUM STAUROGENIAEFORME	COL									X
TRACHELOMONAS	CEL			X						
TOTAL				66418			53616			86301

LAKE NAME: LAKE MEREDITH
STORET NUMBER: 0810

WYGAARD TROPHIC STATE INDICES

DATE	05 06 75	08 21 75	10 07 75
MYXOPHYCEAN	10.0 E	8.00 E	08/0 E
CHLOROPHYCEAN	4.00 E	6.00 E	03/0 E
EUGLENOPHYTE	0.14 ?	0.07 ?	0.09 ?
DIATOM	0/05 ?	0.33 E	0/03 ?
COMPOUND	16.0 E	16.0 E	12/0 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	05 06 75	08 21 75	10 07 75
GENUS	20	11	08
SPECIES	00	06	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		05 06 75	08 21 75	10 07 75
AVERAGE DIVERSITY	H	2.93	1.82	0.22
NUMBER OF TAXA	S	26.00	23.00	15.00
NUMBER OF SAMPLES COMPOSITED	M	3.00	3.00	3.00
MAXIMUM DIVERSITY	MAXH	4.70	4.52	3.91
MINIMUM DIVERSITY	MINH	0.01	0.00	0.00
TOTAL DIVERSITY	D	94741.55	315247.66	209865.48
TOTAL NUMBER OF INDIVIDUALS/ML	N	32335.00	173213.00	953934.00
EVENNESS COMPONENT	J	0.62	0.40	0.06
RELATIVE EVENNESS	RJ	0.63	0.41	0.06
MEAN NUMBER OF INDIVIDUALS/TAXA	L	1243.65	7531.00	63595.60
NUMBER/ML OF MOST ABUNDANT TAXON	K	11340.00	85012.00	930950.00

LAKE NAME: LAKE MERRDITH CONTINUED
STORET NUMBER: 0810

TAXA	FORM	08 06 75 IB	08 06 75 %C	08 06 75 ALGAL UNITS PER ML	08 21 75 IB	08 21 75 %C	08 21 75 ALGAL UNITS PER ML	10 07 75 IB	10 07 75 %C	10 07 75 ALGAL UNITS PER ML
ANABAENA	FIL				13	6.6	11477			
ANABAENOPSIS CIRCULARIS	FIL	14	2.7	878	14	2.0	3400	12	1.4	13091
ANKISTRODESMUS	CEL						X			
APHANOCAPSA	COL		5.4	1756						
APHANOTHECE ?	COL								0.1	1164
CHLOROGONIUM	CEL			X						
CHROOCOCCUS	COL			X						
CHROOCOCCUS DISPERSUS	COL								0.0	291
COELOSPHAERIUM	COL					0.9	1488		0.2	2036
COELOSPHAERIUM KUETZINGIANUM	COL			X						
COSMARIUM	CEL			X		0.2	428			
CRYPTOMONAS EROSA	CEL				15	1.0	1700			
CYCLOTELLA MENEGHINIANA	CEL					0.4	638			
CYLINDROTHECA ? GRACILIS	CEL	11	20.4	6584			X	13	0.2	1455
DACTYLOCOCCOPSIS	CEL		2.3	732						
ENTOMONEIS ALATA	CEL		0.2	73						
EUGLENA	CEL	8	3.6	1171			X			
FLAGELLATE	CEL		10.6	3438						
FRAGILARIA CROTONENSIS	CEL			X			X			
GLENODINIUM	CEL		1.6	512						
GLENODINIUM EDAX	CEL					0.2	425			
GYROSIGMA	CEL						X			
GYROSIGMA MACRUM ?	CEL		0.2	73				15	0.1	873
LAGERHEINIA	CEL					0.2	428			
LYNGBYA	FIL		0.7	219					0.1	1164
MERISMOPEDIA MINIMA	COL					0.2	428			
MERISMOPEDIA TENUISSIMA	COL			X	11	49.1	85012			X
MICROCYSTIS INCERTA	COL					1.1	1913			
NAVICULA	CEL		0.5	146						
OOCYSTIS	CEL		2.9	951		0.5	850			X
OSCILLATORIA 91	FIL	13	10.6	3438				14	0.2	1455
OSCILLATORIA 92	FIL					0.1	213			
OSCILLATORIA LIMNETICA	FIL	12	38.1	11340	12	36.8	63759	11	97.6	930950
PHACUS	CEL								0.1	582
PHACUS MEGALOPSIS	CEL		1.1	366						
PLEUROSIGMA	CEL		0.7	219					0.1	582
SCENEDESMUS ACUMINATUS	CEL		1.4	439						X
SCENEDESMUS QUADRICAUDA	COL			X		0.1	213			
SCHROEDERIA SETIGERA	CEL						X			
SPERMATOZOOPSIS	CEL					0.5	850			
SPIRULINA	CEL			X						
TETRAEDRON MINIMUM	CEL						X		0.0	291
TETRASTRUM STAUROGENIAEFORME	COL			X						
TOTAL				32335			173213			953934

LAKE NAME: MILTON RES.
STORET NUMBER: 0811

NYGAARD TROPHIC STATE INDICES

DATE	05 06 75	08 26 75	10 10 75
MYXOPHYCEAN	01/0 E	02/0 E	1,00 E
CHLOROPHYCEAN	03/0 E	02/0 E	6,00 E
EUGLENOPHYTE	0/04 ?	0/04 ?	0/07 ?
DIATOM	0/01 ?	0,37 E	0,50 E
COMPOUND	04/0 E	07/0 E	9,00 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	05 06 75	08 26 75	10 10 75
GENUS	04	01	04
SPECIES	04	00	02

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		05 06 75	08 26 75	10 10 75
AVERAGE DIVERSITY	H	2,50	3,14	2,48
NUMBER OF TAXA	S	8,00	18,00	16,00
NUMBER OF SAMPLES COMPOSITED	M	2,00	2,00	2,00
MAXIMUM DIVERSITY	MAXH	3,00	4,17	4,00
MINIMUM DIVERSITY	MINH	0,17	0,09	0,23
TOTAL DIVERSITY	D	1020,00	7878,26	1798,00
TOTAL NUMBER OF INDIVIDUALS/ML	N	408,00	2509,00	725,00
EVENNESS COMPONENT	J	0,83	0,75	0,62
RELATIVE EVENNESS	RJ	0,83	0,75	0,60
MEAN NUMBER OF INDIVIDUALS/TAXA	L	51,00	139,39	45,31
NUMBER/ML OF MOST ABUNDANT TAXON	K	102,00	406,00	272,00

LAKE NAME: MILTON PRS.
STORET NUMBER: 0011

CONTINUED

TAXA	FORM	05 06 75 IB	05 06 75 %C	05 06 75 ALGAL UNITS PER ML	08 26 75 IB	08 26 75 %C	08 26 75 ALGAL UNITS PER ML	10 10 75 IB	10 10 75 %C	10 10 75 ALGAL UNITS PER ML
ANABAENA PLANCTONICA	FIL				1	13,2	332			
APHANIZOMENON FLOS-AQUAE	FIL			X				1	6,2	46
ASTERIONELLA FORMOSA	CEL				2	14,7	369			
CHROOMONAS ?	CEL	14	28,0	102	1	16,2	406	14	37,5	272
CLOSTERIUM	CEL									X
COCCONEIS PLACENTULA	CEL					2,9	74			
COELASTRUM MICROPORUM	COL									X
CRYPTONONAS	CEL						X			
CRYPTONONAS EROSA	CEL	1	13,5	51		4,4	111			
CRYPTONONAS MARSSONII	CEL	2	13,5	51				1	6,2	46
CYANOPHYTAN FILAMENT	FIL						X			
CICLOTELLA MENEGHINIANA	CEL						X	1	13,6	91
CYMBELLA	CEL						X			
FRAGILARIA #2	CEL				1	10,3	250			
FRAGILARIA CROTONENSIS	CEL			X	3	11,8	295			
MELOSIRA DISTANS	CEL				1	11,8	295			
MELOSIRA GRANULATA V. ANGUSTISSIMA	CEL				4	11,8	295			
NAVICULA #1	CEL									X
NAVICULA #2	CEL									X
NAVICULA #3	CEL						X			
NAVICULA #4	CEL						X			
NITZSCHIA	CEL							1	13,8	136
OOCYSTIS	COL								6,2	46
PEDIASTRUM BORYANUM	COL	11	28,0	102			X			X
PEDIASTRUM SIMPLEX V. DUODENARIUM	COL									X
PENNATE DIATOM	CEL								13,6	91
SCENEDESMUS QUADRICAUDA	COL	1	13,5	51						
SCHROEDERIA	CEL					2,9	74			
SCHROEDERIA JUDAYI	CEL									X
SCHROEDERIA SETIGERA	CEL	1	13,5	51						
SPHAEROCYSTIS SCHROETERI	COL									X
STEPHANODIACUS	CEL									X
TABELLARIA FENESTRATA	CEL						X			
TOTAL				409			2809			728

LAKE NAME: NAVAJO LAKE
STORET NUMBER: 0812

WYGAARD TROPHIC STATE INDICES

DATE	08 18 75	09 30 75
MYXOPHYCEAN	1.00 E	01/0 E
CHLOROPHYCEAN	1.00 E	0/0 O
EUGLENOPHYTE	0/02 ?	0/01 ?
DIATOM	0/03 ?	0/0 ?
COMPOUND	2.00 E	01/0 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	08 18 75	09 30 75
GENUS	00	00
SPECIES	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		08 18 75	09 30 75
AVERAGE DIVERSITY	H	0.72	1.15
NUMBER OF TAXA	S	8.00	5.00
NUMBER OF SAMPLES COMPOSITED	M	7.00	7.00
MAXIMUM DIVERSITY	MAXH	3.00	2.32
MINIMUM DIVERSITY	MINH	0.22	0.05
TOTAL DIVERSITY	D	227.52	1028.80
TOTAL NUMBER OF INDIVIDUALS/ML	N	316.00	892.00
EVENNESS COMPONENT	J	0.24	0.50
RELATIVE EVENNESS	RJ	0.18	0.49
MEAN NUMBER OF INDIVIDUALS/TAXA	L	39.50	178.40
NUMBER/ML OF MOST ABUNDANT TAXON	K	253.00	605.00

LAKE NAME: NAVAJO LAKE CONTINUED
STORET NUMBER: 0812

TAXA	FORM	08 18 75 %	08 18 75 QC	08 18 75 ALGAL UNITS PER ML	09 30 75 %	09 30 75 QC	09 30 75 ALGAL UNITS PER ML
APHANIZOMENON FLOS-AQUAE	FIL	11	19.9	63			X
CERATIUM HIRUNDINELLA F. SCOTTICUM	CEL			X			
CHRODMONAS ?	CEL				12	67.8	605
CRYPTOMONAS	CEL	12	80.1	253			
CRYPTOMONAS EROSA	CEL				11	25.0	223
CRYPTOMONAS MARSSONII	CEL				13	7.3	64
CYST	CEL						X
EPITHEMIA	CEL			X			
NITZSCHIA	CEL			X			
SPHAEROCYSTIS SCHROETERI	COL			X			
STAURASTRUM	CEL			X			
SYNEDRA	CEL			X			
TOTAL				316			892

LAKE NAME: SHADOW MTN. LAKE
STORET NUMBER: 0813

NYGAARD TROPHIC STATE INDICES

DATE	08 26 75	10 10 75
MYXOPHYCEAN	3.00 E	1.00 E
CHLOROPHYCEAN	4.00 E	3.00 E
EUGLENOPHYTE	0/07 ?	0/04 ?
DIATOM	0.25 ?	0.25 ?
COMPOUND	8.00 E	6.00 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	08 26 75	10 10 75
GENUS	05	01
SPECIES	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		08 26 75	10 10 75
AVERAGE DIVERSITY	H	2.97	2.50
NUMBER OF TAXA	S	15.00	22.00
NUMBER OF SAMPLES COMPOSITED	M	3.00	3.00
MAXIMUM DIVERSITY	MAXH	3.91	4.46
MINIMUM DIVERSITY	MINH	0.07	0.14
TOTAL DIVERSITY	D	7623.99	4452.50
TOTAL NUMBER OF INDIVIDUALS/ML	N	2567.00	1781.00
EVENNESS COMPONENT	J	0.76	0.56
RELATIVE EVENNESS	RJ	0.76	0.55
MEAN NUMBER OF INDIVIDUALS/TAXA	L	171.13	80.95
NUMBER/ML OF MOST ABUNDANT TAXON	K	630.00	706.00

LAKE NAME: SHADOW MTN. LAKE CONTINUED
STORET NUMBER: 0813

TAXA	FORM	08 26 75 IB	08 26 75 %C	08 26 75 ALGAL UNITS PER ML	10 10 75 IB	10 10 75 %C	10 10 75 ALGAL UNITS PER ML
ANABAENA	FIL						X
ANKISTRODESMUS FALCATUS V. ACICULARIS	CEL					1.7	31
APHANIZOMENON FLOS-AQUAE	FIL	1	24.5	630			
ASTERIONELLA FORMOSA	CEL	15	3.8	97	13	13.8	246
CHROOMONAS ?	CEL		11.3	291		10.3	184
COSMARIUM	CEL			X			
CRYPTOMONAS	CEL						X
CRYPTOMONAS MARSSONII	CEL						X
CRYPTOMONAS SPP.	CEL				13	13.8	246
CYCLOTELLA BODANICA	CEL						X
CYST	COL		1.9	48			
DIATOMA TENUE V. ELONGATUM	CEL						X
DICTYOSPHAERIUM PULCHELLUM	COL						X
DINOBRION BAVARICUM	CEL						X
DINOBRYON CYLINDRICUM	CEL						X
FRAGILARIA 01	CEL						X
FRAGILARIA CROTONENSIS	CEL					1.7	31
FRAGILARIA LEPTOSTAURON	CEL						X
GOMPHONEMA	CEL			X			
MALLOMONAS	CEL						X
NASTOGLOIA ? SMITHII	CEL		1.9	48			
MELOSIRA ITALICA	CEL				11	39.6	706
MICROCYSTIS AERUGINOSA	COL	12	15.1	380			
NITZSCHIA	CEL		9.4	242			
PEDIASTRUM BORYANUM	COL	13	5.6	145			
PEDIASTRUM SIMPLEX V. DUODENARIUM	COL			X			
PENNATE DIATOM	CEL				18	10.3	184
PHORMIDIUM MUCICOLA	FIL	14	30.8	833			
SCENEDESMUS ARMATUS	COL		1.9	48			
SCHROEDERIA SETIGERA	CEL						X
SPHAEROCYSTIS SCHROETERI	COL		3.8	97			
SPONDYLOSIUM PLANUM	CEL				41	8.6	153
STEPHANODISCUS	CEL			X			
SYNEDRA ULNA	CEL						X
TABELLARIA	CEL						X
TOTAL				2567			1781